ENVIRONMENTAL QUALITY

CHAPTER 56

UNDERGROUND STORAGE TANKS
PETROLEUM AND CHEMICAL SUBSTANCES

Sub-Chapter 4

Release Detection

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Release Detection

17.56.401 GENERAL REQUIREMENTS FOR ALL UST SYSTEMS

(1) Owners and operators of new and existing UST systems must provide a method, or combination of methods, of release detection that:

(a) can detect a release from any portion of the tank and the connected underground piping that routinely contains product;

(b) is installed, calibrated, operated, and maintained in accordance with the manufacturer's instructions, including routine maintenance and service checks for operability or running condition; and

(c) meets the performance requirements in ARM 17.56.407 or 17.56.408, with any performance claims and their manner of determination described in writing by the equipment manufacturer or installer. In addition, methods used after December 22, 1990, except for methods permanently installed prior to that date, must be capable of detecting a leak rate or quantity specified for that method in ARM 17.56.407(1)(b) through (d) or 17.56.408(1)(a) and (b) with a probability of detection of 0.95 and a probability of false alarm of 0.05.

(2) When a release detection method operated in accordance with the performance standards in ARM 17.56.407 and 17.56.408 indicates a release may have occurred, owners and operators must notify the department and the implementing agency in accordance with subchapter 5.

(3) Owners and operators of all UST systems must comply with the release detection requirements of this subchapter by December 22 of the year listed in the following table below:

SCHEDULE FOR PHASE-IN OF RELEASE DETECTION

Year system was installed	Year when release detection is required (by December 22 of the year indicated) 1989	1990	1991	1992	1993
Before 1965 or date unknown	RD	P			
1965-69		P/RD			
1970-74		P	RD		
1975-79		P		RD	
1980-88		P			RD
New tanks (after Dec. 22, 1988) immediately upon installation.					

P = Must begin release detection for all pressurized piping in accordance with ARM 17.56.402(1)(b)(i) and 17.56.403(2)(d).

RD = Must begin release detection for tanks and suction piping in accordance with ARM 17.56.402(1)(a) and (b)(ii), and 17.56.403.

(4) Farm or residential tanks of 1100 gallons or less capacity used for storing motor fuel for non-commercial purposes, heating oil tanks, and emergency power generator tanks which were installed before 1965 or for which the date of installation is unknown, must comply with release detection requirements by December 22, 1990. Any of these types of tanks installed on or after January 1, 1965, must follow the schedule set forth in (3).

(5) Any existing UST system that cannot apply a method of release detection that complies with the requirements of this subchapter must complete the closure procedures in subchapter 7 by the date on which release detection is required for that UST system under (4). (History: 75-11-505, MCA; IMP, 75-11-505, MCA; NEW, 1989 MAR p. 1912, Eff. 11/23/89; TRANS, from DHES, 1995 MAR p. 2259; AMD, 2003 MAR p. 1079, Eff. 5/23/03.)

17.56.402 REQUIREMENTS FOR PETROLEUM UST SYSTEMS

(1) Owners and operators of petroleum UST systems must provide release detection for tanks and piping as follows:

(a) tanks must be monitored at least every 30 days for releases using one of the methods listed in ARM 17.56.407(1)(d) through (h) except that:

(i) UST systems that meet the performance standards in ARM 17.56.201 or 17.56.202, and the monthly inventory control requirements in ARM 17.56.407(1)(a) or (b), may use tank tightness testing (conducted in accordance with ARM 17.56.407(1)(c)) at least every five years until December 22, 1998, or until 10 years after the tank is installed or upgraded under ARM 17.56.202(2), whichever is later;

(ii) UST systems that do not meet the performance standards in ARM 17.56.201 or 17.56.202 may use monthly inventory controls (conducted in accordance with ARM 17.56.407(1)(a) or (b)) and annual tank tightness testing (conducted in accordance with ARM 17.56.407(1)(c)) until December 22, 1998, when the tank must be upgraded under ARM 17.56.202 or permanently closed under ARM 17.56.702;

(iii) tanks with capacity of 550 gallons or less may use weekly tank gauging (conducted in accordance with ARM 17.56.407(1)(b)); and

(iv) farm or residential tanks of 1100 gallons or less capacity used for storing motor fuel for non-commercial purposes, a tank of 1100 gallons or less capacity used for storing heating oil for consumptive use on the premises where stored, and emergency power generator tanks with capacities of 1100 gallons or less capacity may use yearly tank gauging (conducted in accordance with ARM 17.56.407(1)(b)).

(b) underground piping that routinely contains regulated substances must be monitored for releases in a manner that meets one of the following requirements:

(i) underground piping that conveys regulated substances under pressure must:

(A) be equipped with an automatic line leak detector conducted in accordance with ARM 17.56.408(1)(a); and

(B) have an annual line tightness test conducted in accordance with ARM 17.56.408(1)(b) or have monthly monitoring conducted in accordance with ARM 17.56.408(1)(c).

(ii) underground piping that conveys regulated substances under suction must either have a line tightness test conducted at least every three years and in accordance with ARM 17.56.408(1)(b), or use a monthly monitoring method conducted in accordance with ARM 17.56.408(1)(c). No release detection is required for suction piping that is designed and constructed to meet the following standards:

(A) the below-grade piping operates at less than atmospheric pressure;

(B) the below-grade piping is closed so that the contents of the pipe will drain back into the storage tank if the suction is released;

(C) only one check valve is included in each suction line;

(D) the check valve is located directly below and as close as practical to the suction pump; and

(E) a method is provided that allows compliance with (1)(b)(ii)(B) through (D) to be readily determined.

(iii) underground piping connected to heating oil tanks with a capacity of 660 gallons or less is exempt from the requirements of (1)(b)(i) and (ii) provided that:

(A) the new primary underground piping has secondary containment;

(B) liquid released into the interstitial space will move not more than 20 feet before being detected in a standpipe or sump;

(C) the interstice is visually monitored for released liquid once every 30 days; and

(D) the test results are maintained for at least one year.

(iv) new underground piping connected to underground heating oil tanks with a capacity of 660 gallons or less shall slope back towards tanks that do not have foot valves. (History: 75-11-302, 75-11-505, MCA; IMP, 75-11-302, 75-11-505, MCA; NEW, 1989 MAR p. 1912, Eff. 11/23/89; TRANS, from DHES, 1995 MAR p. 2559, Eff. 7/1/95; AMD, 1995 MAR p. 2488, Eff. 11/23/95; TRANS, from DHES, 1995 MAR p. 2259; AMD, 2003 MAR p. 1079, Eff. 5/23/03.)

17.56.403 REQUIREMENTS FOR HAZARDOUS SUBSTANCE UST SYSTEMS

Owners and operators of hazardous substance UST systems must provide release detection that meets the following requirements:

(1) Release detection at existing UST systems must meet the requirements for petroleum UST systems in ARM 17.56.402. By December 22, 1998, all existing hazardous substance UST systems must meet the release detection requirements for new systems in (2) of this rule.

(2) Release detection at new hazardous substance UST systems must meet the following requirements as provided in 40 CFR 265.193, adopted by reference in this rule:

(a) secondary containment systems must be designed, constructed and installed to:

(i) contain regulated substances released from the tank system until they are detected and removed;

(ii) prevent the release of regulated substances to the environment at any time during the operational life of the UST system; and

(iii) be checked for evidence of a release at least every 30 days.

(b) double-walled tanks must be designed, constructed, and installed to:

(i) contain a release from any portion of the inner tank within the outer wall; and

(ii) detect the failure of the inner wall.

(c) external liners (including vaults) must be designed, constructed, and installed to:

(i) contain 100% of the capacity of the largest tank within its boundary;

(ii) prevent the interference of precipitation or ground water intrusion with the ability to contain or detect a release of regulated substances; and

(iii) surround the tank completely (i.e., it is capable of preventing lateral as well as vertical migration of regulated substances).

(d) underground piping must be equipped with secondary containment that satisfies the requirements of (a) above (e.g., trench liners, jacketing of double-walled pipe). In addition, underground piping that conveys regulated substances under pressure must be equipped with an automatic line leak detector in accordance with ARM 17.56.408(1). The department hereby adopts and incorporates by reference 40 CFR 265.193, Containment and Detection of Releases which sets forth standards for secondary containment and detection of releases of UST systems and a copy of which may be obtained from Superintendent of Documents, Government Printing Office, Washington, DC 20402, (202) 783-3238. (History: 75-10-405, MCA; IMP, 75-10-405, MCA; NEW, 1989 MAR p. 1912, Eff. 11/23/89; TRANS, from DHES, 1995 MAR p. 2259.)

Rules 17.56.404 through 17.56.406 reserved

17.56.407 METHODS OF RELEASE DETECTION FOR TANKS

(1) Each method of release detection for tanks used to meet the requirements of ARM 17.56.402 must be conducted in accordance with the following:

(a) product inventory control (or another test of equivalent performance) must be conducted monthly to detect a release of at least 1.0% of flow-through plus 130 gallons on a monthly basis in the following manner:

(i) inventory volume measurements for regulated substance inputs, withdrawals, and the amount still remaining in the tank are recorded each operating day;

(ii) the equipment used is capable of measuring the level of product over the full range of the tank's height to the nearest one-eighth of an inch;

(iii) the regulated substance inputs are reconciled with delivery receipts by measurement of the tank inventory volume before and after delivery;

(iv) deliveries are made through a drop tube that extends to within one foot of the tank bottom;

(v) product dispensing is metered and recorded within for an accuracy of six cubic inches for every five gallons of product withdrawn; and

(vi) the measurement of any water level in the bottom of the tank is made to the nearest one-eighth of an inch at least once a month.

(b) manual tank gauging must meet the following requirements:

(i) tank liquid level measurements are taken at the beginning and ending of a period of at least 36 hours during which no liquid is added to or removed from the tank;

(ii) level measurements are based on an average of two consecutive stick readings at both the beginning and ending of the period;

(iii) the equipment used is capable of measuring the level of product over the full range of the tank's height to the nearest one-eighth of an inch;

(iv) a leak is suspected and subject to the requirements of subchapter 5 if the variation between beginning and ending measurements exceeds the weekly or monthly standards in the following table:

Nominal tank capacity	Weekly standard (one test)	Monthly standard (average of four tests)
550 gallons or less	10 gallons.....	5 gallons
551-1000 gallons	13 gallons.....	7 gallons
1001-2000 gallons	26 gallons.....	13 gallons

(v) tanks of 550 gallons or less nominal capacity may use this method as the sole method of release detection. Tanks of 551 to 2000 gallons may use the method in place of manual inventory control in (1)(a). Tanks of greater than 2000 gallons nominal capacity may not use this method to meet the requirements of this subchapter.

(vi) tanks listed in ARM 17.56.402(1)(a)(iv) may use this method of release detection as the sole method of annual tank tightness testing.

(c) tank tightness testing (or another test of equivalent performance) must be capable of detecting a 0.1 gallon per hour leak rate from any portion of the tank that routinely contains product while accounting for the effects of thermal expansion or contraction of the product, vapor pockets, tank deformation, evaporation or condensation, and the location of the water table.

(d) equipment for automatic tank gauging that tests for the loss of product and conducts inventory control must meet the following requirements:

(i) the automatic product level monitor test can detect a 0.2 gallon per hour leak rate from any portion of the tank that routinely contains product; and

(ii) inventory control (or another test of equivalent performance) is conducted in accordance with the requirements of (1)(a).

(e) testing or monitoring for vapors within the soil gas of the excavation zone must meet the following requirements:

(i) the materials used as backfill are sufficiently porous (e.g., gravel, sand, crushed rock) to readily allow diffusion of vapors from releases into the excavation area;

(ii) the stored regulated substance, or a tracer compound placed in the tank system, is sufficiently volatile (e.g., gasoline) to result in a vapor level that is detectable by the monitoring devices located in the excavation zone in the event of a release from the tank;

(iii) the measurement of vapors by the monitoring device is not rendered inoperative by the ground water, rainfall, or soil moisture or other known interferences so that a release could go undetected for more than 30 days;

(iv) the level of background contamination in the excavation zone will not interfere with the method used to detect releases from the tank;

(v) the vapor monitors are designed and operated to detect any significant increase in concentration above background of the regulated substance stored in the tank system, a component or components of that substance, or a tracer compound placed in the tank system;

(vi) in the UST excavation zone, the site is assessed to ensure compliance with the requirements in (1)(e)(i) through (iv) and to establish the number and positioning of monitoring wells that will detect releases within the excavation zone from any portion of the tank that routinely contains product; and

(vii) monitoring wells are clearly marked and secured to avoid unauthorized access and tampering.

(f) testing or monitoring for liquids on the ground water must meet the following requirements:

(i) the regulated substance stored is immiscible in water and has a specific gravity of less than one;

(ii) ground water is never more than 20 feet from the ground surface and the hydraulic conductivity of the soil(s) between the UST system and the monitoring wells or devices is not less than 0.01 cm/sec (e.g., the soil should consist of gravels, coarse to medium sands, course silts or other permeable materials);

(iii) the slotted portion of the monitoring well casing must be designed to prevent migration of natural soils or filter pack into the well and to allow entry of regulated substance on the water table into the well under both high and low ground water conditions, as well as all conditions between the high and low ground water conditions;

(iv) monitoring wells shall be sealed from the ground surface to the top of the filter pack;

(v) monitoring wells or devices intercept the excavation zone or are as close to it as is technically feasible;

(vi) the continuous monitoring devices or manual methods used can detect the presence of at least one-eighth of an inch of free product on top of the ground water in the monitoring wells;

(vii) within and immediately below the UST system excavation zone, the site is assessed to ensure compliance with the requirements in (1)(f)(i) through (v) and to establish the number and positioning of monitoring wells or devices that will detect releases from any portion of the tank that routinely contains product;

(viii) monitoring wells are clearly marked and secured to avoid unauthorized access and tampering; and

(ix) monitoring wells must be accessible for the sampling purposes of ARM 17.56.503.

(g) interstitial monitoring between the UST system and a secondary barrier immediately around or beneath it may be used, but only if the system is designed, constructed and installed to detect a leak from any portion of the tank that routinely contains product and also meets one of the following requirements:

(i) for double-walled UST systems, the sampling or testing method can detect a release through the inner wall in any portion of the tank that routinely contains product;

(ii) for UST systems with a secondary barrier within the excavation zone, the sampling or testing method used can detect a release between the UST system and the secondary barrier;

(A) the secondary barrier around or beneath the UST system consists of artificially constructed material that is sufficiently thick and impermeable (at least 10^{-6} cm/sec for the regulated substance stored) to direct a release to the monitoring point and permit its detection;

(B) the barrier is compatible with the regulated substance stored so that a release from the UST system will not cause a deterioration of the barrier allowing a release to pass through undetected;

(C) for cathodically protected tanks, the secondary barrier must be installed so that it does not interfere with the proper operation of the cathodic protection system;

(D) the ground water, soil moisture, or rainfall will not render the testing or sampling method used inoperative so that a release could go undetected for more than 30 days;

(E) the site is assessed to ensure that the secondary barrier is always above the ground water and not in a 25-year flood plain, unless the barrier and monitoring designs are for use under such conditions; and

(F) monitoring wells are clearly marked and secured to avoid unauthorized access and tampering.

(iii) for tanks with an internally fitted liner, an automated device can detect a release between the inner wall of the tank and the liner, and the liner is compatible with the substance stored.

(h) any other type of release detection method, or combination of methods, can be used if it can detect a 0.2 gallon per hour leak rate or a release of 150 gallons within a month with a probability of detection of 0.95 and a probability of false alarm of 0.05. (History: 75-11-505, MCA; IMP, 75-11-505, MCA; NEW, 1989 MAR p. 1912, Eff. 11/23/89; TRANS, from DHES, 1995 MAR p. 2259; AMD, 2003 MAR p. 1079, Eff. 5/23/03.)

17.56.408 METHODS OF RELEASE DETECTION FOR PIPING (1) Each method of release detection for piping used to meet the requirements of ARM 17.56.402 must be conducted in accordance with the following:

(a) Methods which alert the operator to the presence of a leak by restricting or shutting off the flow of regulated substances through piping or triggering an audible or visual alarm may be used only if they detect leaks of three gallons per hour at 10 pounds per square inch line pressure within one hour. An annual test of the operation of the leak detector must be conducted in accordance with the manufacturer's requirements.

(b) A periodic test of piping may be conducted only if it can detect a 0.1 gallon per hour leak rate at 1 1/2 times the operating pressure.

(c) Any of the methods in ARM 17.56.407(1)(e) through (h) may be used if they are designed to detect a release from any portion of the underground piping that routinely contains regulated substances. (History: 75-11-505, MCA; IMP, 75-11-505, MCA; NEW, 1989 MAR p. 1912, Eff. 11/23/89; TRANS, from DHES, 1995 MAR p. 2259; AMD, 2003 MAR p. 1079, Eff. 5/23/03.)

17.56.409 RELEASE DETECTION RECORDKEEPING (1) All UST system owners and operators must maintain records in accordance with ARM 17.56.305 demonstrating compliance with all applicable requirements of this subchapter. These records must include the following:

(a) all written performance claims pertaining to any release detection system used, and the manner in which these claims have been justified or tested by the equipment manufacturer or installer, must be maintained for the operating life of the release detection system;

(b) the results of any sampling, testing, or monitoring must be maintained for at least one year, except that the results of tank tightness testing conducted in accordance with ARM 17.56.407(1)(c) must be retained until the next test is conducted; and

(c) written documentation of all calibration, maintenance, and repair of release detection equipment permanently located on-site must be maintained for at least one year after the servicing work is completed. Any schedules of required calibration and maintenance provided by the release detection equipment manufacturer must be retained for the operating life of the release detection system. (History: 75-11-505, MCA; IMP, 75-11-505, MCA; NEW, 1989 MAR p. 1912, Eff. 11/23/89; TRANS, from DHES, 1995 MAR p. 2259; AMD, 2003 MAR p. 1079, Eff. 5/23/03.)